

Patent
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REMARKS

Reconsideration of this application is respectfully requested. Claims 26-29, 31-53 and 55 are still in the application. If the present amendments are entered, the claims pending in the application will be claims 26-29, 31, 32, 34-43, 45, 47-51, 53 and 55. Before considering the proposed amendments, applicants would like to review the present invention.

The Invention

The present invention is concerned with the preparation of a plastic sheet product prepared from at least two layers of thermoplastic materials, that offers an improved matte finish and improved resistance to smudging, abrasion and weathering, and the corresponding degradation of the desired textured appearance (specification, pages 1-2), and that presents an appearance that closely replicates frosted glass. As such, the present invention focuses on the preparation of a product that provides a desired decorative effect or quality, while at the same time providing desirable and unexpected improvements in structural qualities and corresponding improvements in durability and appearance over time. Representative products that are prepared from the compositions and sheet products of the invention, include shower door panels, lighting lenses and diffusers, windows, and other applications where a panel exhibiting the appearance and optical properties of frosted glass is desired or needed.

Prior to the development of the present invention, sheet products prepared to provide the decorative effect of a matte or frosted finish, were non uniform in appearance and would degrade extensively in use, so that there were no products that would provide an alternative to actual frosted glass. The accelerated expansion of the materials market for less expensive and lighter weight alternatives to etched/frosted glass has created a need for a product that brings together the advantages of lower cost of materials and manufacture, and lighter weight, all while offering the decorative advantages of the traditional sheet material.

Further, the advantages of the compositions and corresponding products prepared from

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them, are particularly surprising in that they are achieved with the use of discrete particles that have sizes of up to about 80 microns, and preferably from about 20 microns to about 80 microns, and that are present preferentially in concentrations on the order of 12 weight percent or more, of the capstock layer. The ranges of size diameters and particle content are found in the specification and claims as filed, so that no new matter is believed to be entered hereby. Accordingly, entry and favorable consideration of the claims as presented herein is requested.

As will be evident from the abrasion tests that are presented later on herein, the present compositions provide unexpected improvements in abrasion resistance and resistance to haze development, at levels of particle content that would heretofore have been considered contraindicated.

In summary, the present compositions and corresponding products fulfill a need for a synthetic resin based sheet product that offers the optical, decorative and wear properties and advantages of frosted glass, with corresponding advantages over glass in cost of manufacture and maintenance.

The Claims

Turning to the claims, applicants have prepared certain claim revisions, embodied in amended claims 26-29, 31, 32, 34-43, 45, 47-51, 53 and 55, recited above, that reflect the distinctions of the present compositions over those even remotely suggested by the extant prior art.

Thus, primary claims 26 and 27 now recite that the plastic sheet product has an outer layer or capstock composition that is at least 100 microns thick and contains from about 12 to about 30% by weight of discrete particles. These two features of the capstock composition and the corresponding sheet product clearly distinguish it from any sheet product that could be even contemplated from a review of the extant prior art. In fact, the prior art of record teaches away from the percent ranges of particles and the data presented herein further illustrates the advantages of the sheets of the invention, as evidenced in the significant improvements in

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abrasion resistance, weatherability, and retention of the desired frosted glass appearance.

The Rejections Under 35 USC Section 112

Claims 26-29, 31-53 and 55 had been rejected under 35 USC Section 112, first paragraph, as failing to comply with the written description requirement. The rejection is believed to be mooted by the presentation of primary claims 26 and 27 which do not recite the objected to terms. Accordingly, withdrawal of this ground of rejection is believed to be in order and is requested.

The Rejections Under 35 USC Section 103

1. Claims 26-29, 31-47 and 52, 53 and 55 have been rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent No. 5,318,737 to Trabert *et al.* ("Trabert"). As this rejection may pertain to the claims, it is traversed.

Trabert is directed to a specific area within plastics manufacture, and is concerned with "...capstock for plastics.." (Trabert, col. 1, lines 11-13). Trabert seeks to address a problem that arises from the fundamental characteristic of structural laminates, of mismatch in viscosity and flow properties between the core layer and the outer layer or cap. The Trabert disclosure focuses particularly on the mismatch that is observed with laminates having a core layer of ABS and an acrylic cap. As related by Trabert, laminate formation which is generally conducted by procedures such as feedblock co-extrusion, parenthetically, a technique that is per se well known, results in the lateral flow of the molten polymer layers constituting each of the laminae, and the problem identified by the patentees arises when there is a mismatch in the flow properties of the polymers constituting the respective layers. After extrusion and product formation are complete, the lateral edges of the sheet are trimmed, and this material is generally fed back into the vessel containing the core material. In the instance where the trimmed material differs in flow properties from the core material, as described by Trabert with respect to the ABS core and the

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acrylic cap compositions, the acrylic trimmings cause what the patentees refer to as "... (adversely affected) mechanical properties..." in the final laminate. (Trabert, col. 3, lines 18-22). In fact, the resulting laminates frequently exhibit significant and unacceptable surface irregularities ("lumps", etc.), as well as cracking, crazing and even delamination. Trabert's invention proposes to remedy this problem by the preparation and use of a specially formulated capstock composition, that is further characterized by its method of formulation. Thus, a high molecular weight acrylic resin is combined with an "acrylate-based" impact modifier formulation, and the impact modifier, in turn, is separately prepared as discrete multi-layered particles with a non-elastomeric core, a first intermediate coating of an elastomeric polymer, and an outer layer which may correspond in composition to the core, with the "... intermediate layer being linked with the core layer and with the outer layer by an allyl methacrylate graft-linking monomer." (Trabert, col. 5, lines 20-24). This very specific formulation is first mixed with the remainder of Trabert's capstock composition, and the resultant composition is ultimately liquified in its entirety and is thereafter bonded to the core or base, by e.g. feed block co-extrusion.

The Trabert composition is intended for incorporation in plastic products intended for structural applications, and the properties of interest to the patentees that are sought to be improved by the Trabert capstock, are exclusively structural and related to the integrity and durability of the products of interest. To the extent that Trabert contemplates the inclusion of discrete particles in their capstock that may remain immiscible with the remainder of the composition, these are referred to as 'optional fillers' (Trabert, col. 10, lines 56-63), and may be present in a maximum amount of 15% by weight.

Significantly, there is neither the disclosure nor even the interest expressed in Trabert, in the preparation of a product offering an outer appearance emulating frosted glass. Trabert is exclusively focused on remedying the deficiencies of previously manufactured structural laminates, and particularly, those prepared with an ABS core and an acrylic cap layer, and demonstrates no recognition of applicants' problem, let alone even a hint for its solution. Particularly when Trabert is considered in relation to the claims proposed herein, the conclusions

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that are manifest are that

(1) there is no suggestion in Trabert to prepare a composition and a corresponding composite sheet product that has entrained in the outer cap composition thereof discrete particles having diameter sizes ranging from 20 to 80 microns, and in an amount ranging from 12% to 30%, and more particularly, from 22% to 28% by weight of the composition, and wherein the cap composition is present in a thickness ranging from 150 to 400 microns; and, more fundamentally,

(2) there is no suggestion in Trabert to prepare any product offering an appearance corresponding to frosted glass, having improved surface properties of any kind, let alone improvements in abrasion resistance and weathering properties.

The Examiner has applied Trabert alone in rejection of the claims, and has also relied on the teachings of U.S. Patent No. 3,174,107 to Smith for a teaching that the inclusion of larger particles in a polymer confers a dull finish. Applicants submit that the teachings of Smith are totally unrelated to the relevant field of Trabert, let alone to the field and product of the present invention, so that such teachings can provide no guidance to the artisan in the choice of particle size of an included pigment or the like, in the preparation of a product offering the appearance of frosted glass.

Smith relates to the field of coated paper stock, such as that being used for a variety of printing applications, and particularly, relates to an aqueous coating composition for printing paper. At the passage of Smith cited by the Examiner, the reference discusses the factors that determine the gloss of a coated paper product, and states that pigment particle size is such a factor. While Smith refers to 'dull' pigments and relates this characteristic to their particle size, it is submitted that this discussion is presented within the narrow context of the preparation of finishes of mineral coated paper stock. An extension of this teaching to acrylic polymers and particularly, to polymer sheet products offering the appearance of frosted glass, is unsupported, particularly in view of the widely diverse nature of the respective technical fields of the references. Therefore, the artisan would not look to Smith for any guidance as to the choice of a suitable or advantageous particle size for a pigment, relevant to preparation of a composite sheet

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product as such may be of interest to Trabert, let alone to the products that are the object of the present invention.

In conclusion, the Trabert disclosure stands alone and does not benefit from the teachings of Smith, and for the reasons set forth above, fails to offer the suggestion to arrive at the present invention, particularly as set forth in the claims if amended as proposed. Accordingly, withdrawal of the rejection based on Trabert is believed to be in order, and is requested.

2. Claims 48-51 were rejected under 35 USC Section 103(a) as being unpatentable over Trabert *et al.* ("Trabert") in view of U.S. Patent No. 6,225,407 to Jacob *et al.* ("Jacob"). As this rejection may pertain to the claims, particularly if amended as proposed, it is traversed.

The deficiencies of Trabert with respect to the present invention have been discussed in detail above, and such discussion is incorporated by reference and repeated herein. Jacob fails to cure the deficiencies of the primary reference, as Jacob relates to a particular family of polymers that are impact modifiers, and more specifically, are prepared in a core-shell structure as corresponding particles. In col. 11, lines 15-18, the patentees discuss the refractive indices of the core-shell polymers that contain rubbers with low glass transition temperatures. This is all explained to be exemplary, however, and patentees indicate that particular preferred ranges should be determined by reference or regard to particular particles prepared with particular layers or lamina.

The teaching of Jacob in such instance, can hardly be said to be applicable to the teachings of Trabert, let alone to the present invention. Jacob's polymers and their preparation differ and consequently, the particular refractive indices are only applicable to the Jacob disclosure. Therefore, the disclosure of Trabert is not enhanced by reference to Jacob, and the deficiencies of the former reference as against the present invention remain. Accordingly, withdrawal of this ground of rejection is likewise believed to be in order, and is requested.

Fees

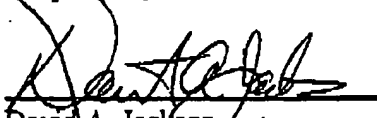
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No other fees are believed to be necessitated by the foregoing Response. However, should this be erroneous, authorization is hereby given to charge Deposit Account No. 11-1153 for any underpayment, or credit any overages.

CONCLUSION

Entry of the foregoing amendments and remarks into the record is requested.
Reconsideration of the claims and an early allowance is earnestly sought.

Respectfully submitted,


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